Money Isn't All You're Saving

Improve Energy Efficiency with Aerosol Duct Sealing

Builder Guide

DESCRIPTION

Typical residential duct systems leak 15-20% of the air that has been heated or cooled by the HVAC equipment, and draw another 15-20% of unconditioned air in through leaky return ducts, often located in the attic, crawl space or basement. Even when the furnace or air conditioner is not running, duct leaks waste energy by contributing to the overall air leakage of the house. In new tight houses, duct leaks can account for 20-25% of total building air leakage.

A new aerosol technology seals duct leaks from *inside* the ducts, using one convenient location - usually near the air handler. After all the house registers are sealed off and the HVAC equipment is by-passed (or not yet installed), the duct system is pressurized with air and an aerosol vapor is injected. As aerosol-laden air is forced out through leaks in the ductwork, the tiny particles deposit in the gaps (not on duct walls), filling the leaks.

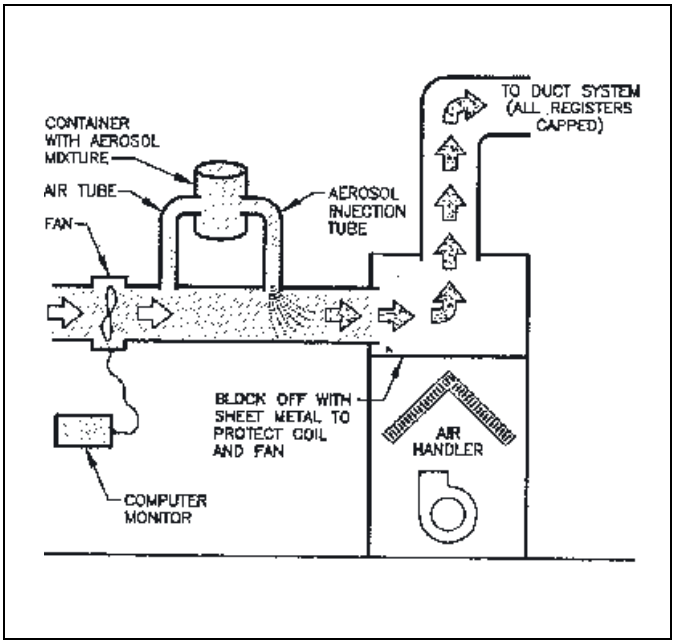
An inexpensive palm-size computer is used to monitor the progress of sealing, indicate potential problems, and print out a certificate of completion. This semi-automated process combines duct sealing with leakage testing, and takes about four hours to perform in simple duct systems.

BENEFITS

❑ Aerosol duct sealing can cost 50% less than manual duct sealing.

Aerosol duct sealing technology can provide all the benefits of manual duct sealing (see the builder fact sheet on Duct Sealing) for about half the cost - including labor and materials. This is because the labor-intensive manual sealing process (tape and mastic) is replaced by the aerosol injection process.

Aerosol Duct Sealing Equipment



❑ Aerosol duct sealing provides testing, documentation and feedback.

Aerosol sealing incorporates leakage testing with documentation of the process, including the level of sealing achieved, the expected energy savings and the effect of sealing on HVAC system capacity. Continual feedback is provided throughout the sealing process on the amount of leakage remaining.

❑ Aerosol duct sealing can be more effective.

Aerosol technology typically seals over 80% of leaks in a duct system, compared to about 60% using conventional sealing methods, and can help identify major duct system problems - such as ducts which became disconnected after installation.

❑ **Aerosol technology can provide a cleaner, safer duct sealing job.**

Contractors are relieved of having to crawl around in cramped spaces looking for duct leaks and applying messy mastic. In fact, they can do other things during the automated aerosol injection process.

❑ **Duct sealing documentation can reduce contractor liability.**

Documentation of duct sealing can reduce builder liability associated with HVAC system performance, and result in more satisfied home buyers. Safety of occupants is improved - and builder liability is effectively reduced - because sealed ducts reduce the possibility of backdrafting from gas or oil appliances and fireplaces. Backdrafting - or flue-gas reversal - can introduce carbon monoxide, combustion gases and smoke into the home. And when comfort is improved, builders are likely to experience fewer callbacks associated with HVAC performance.

❑ **Aerosol duct sealing provides flexible scheduling.**

Aerosol sealing can be performed any time after the duct system is installed, allowing schedule flexibility.

INTEGRATION

❑ **Aerosol duct sealing and leakage testing should be done by experienced professionals.**

Working on duct systems can change pressure distribution in a house. These changes can affect combustion appliance safety, indoor air quality, and occupant comfort. Aerosol duct sealing should only be performed by individuals who have a working knowledge of this new technology, and know how to take appropriate precautions.

RESOURCES

❑ Aerosol-Based Duct Sealing Home Page http://eande.lbl.gov/CBS/NEWSLETTER/NL5/Duct.html
Source: Indoor Environment Group, Energy & Environment Division, Lawrence Berkeley National Laboratory, Berkeley CA, (510) 486-4678.

❑ *"Ducts Rediscovered", Home Energy* Magazine, Sep/Oct 1993. Available at 510-524-5405.

❑ *A Builder's Guide to Residential HVAC Systems*. Available in January 1997 from the National Association of Home Builders (NAHB) Press, 1-800-223-2665.

❑ *"Energy Efficient Ducts: How and Why"*, Electric Power Research Institute, Report TR-106443. Available in January 1997 from the EPRI Distribution Center, Oakland CA, (510) 934-4212.

❑ Air Conditioning Contractors of America. *Manual D: Residential Duct Systems,* 1995, 2nd printing. Available from the ACCA, Washington DC, (202) 483-9370.